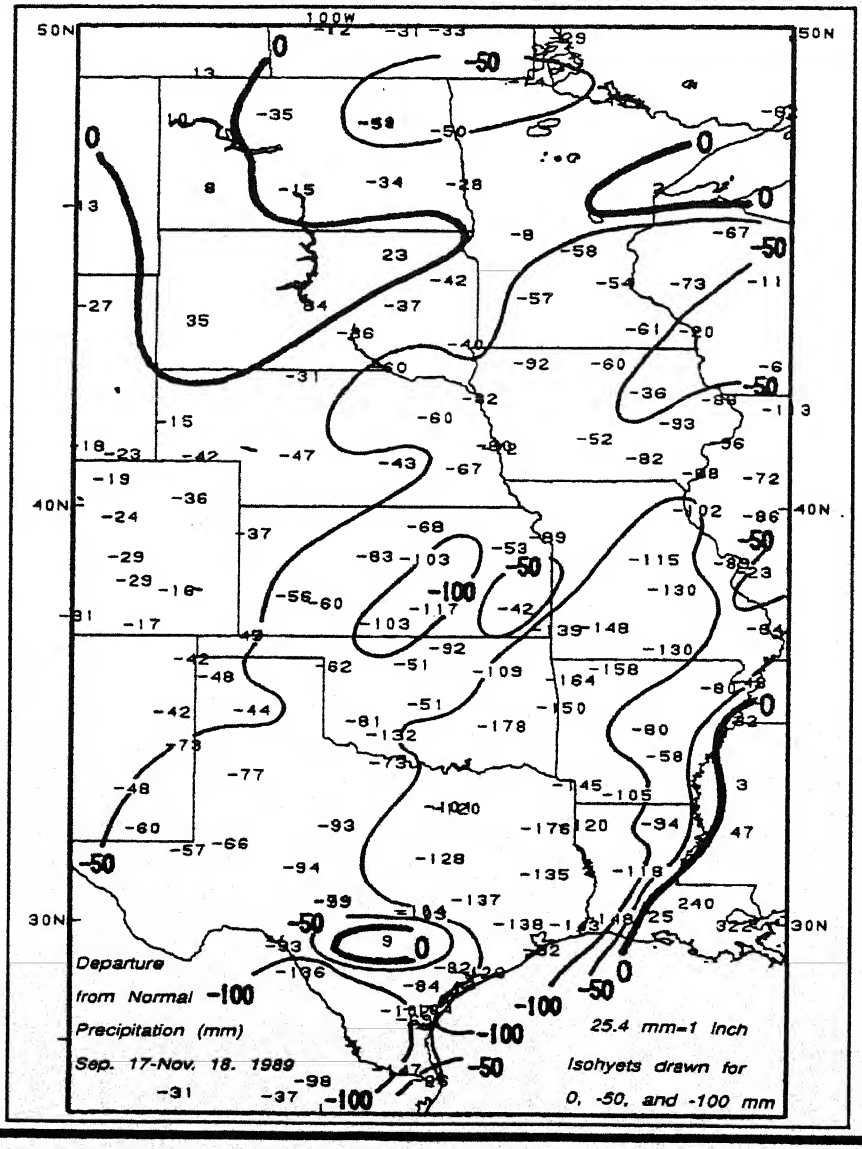
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

No. 89/46 Washington, DC November 18, 1989



AFTER EXPERIENCING EXTREMELY WET WEATHER DURING THE LATE SPRING AND SUMMER MONTHS, PARTICULARLY IN THE SOUTH-CENTRAL GREAT PLAINS AND THE LOWER MISSISSIPPI VALLEY, VERY LITTLE PRECIPITATION HAS FALLEN ON MUCH OF THE NATION'S MIDSECTION SINCE MID-SEPTEMBER. WITH MOST LOCATIONS MEASURING LESS THAN HALF THE NORMAL PRECIPITATION DURING THE PAST 9 WEEKS, DEFICITS OF 50 - 100 MM HAVE ACCUMULATED IN THE CENTRAL GREAT PLAINS AND WESTERN CORN BELT WHILE DEPARTURES EXCEEDING -150 MM EXIST IN PARTS OF THE SOUTHEASTERN GREAT PLAINS AND LOWER MISSISSIPPI VALLEY.

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER

CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- U.S. cooling degree days (summer) or heating degree days (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every three months).
- Global three-month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF NOVEMBER 18, 1989

1. Alaska and Northwestern Canada:

COLD SPELL CONTINUES.

Average temperatures remained up to 13°C below normal last week, and readings plunged as low as -49°C. Wind chills below -60°C occurred at several stations in the interior of Alaska (see U. S. Weekly Climate Highlights) [3 weeks].

2. South-Central Great Plains:

DRY CONDITIONS LINGER.

Little or no precipitation was reported across the region. Substantial areas of dryness persisted; however, evaporative losses diminished from the previous week as cold, dry air replaced the unseasonably mild Indian summer weather (see U. S. Weekly Climate Highlights) [9 weeks].

3. Uruguay and Adjacent Argentina:

HEAVY RAINS REPORTED.

Very heavy rains, exceeding 150 mm at some stations, fell across the area. Paysandu, Uruguay observed 124 mm of precipitation on Sunday, November 12 [Episodic Event].

4. Southwestern Europe:

STILL WARM.

Temperatures averaged up to 5°C above normal as warm weather persisted in northern Spain and southwestern France. Below normal temperatures ended the warm spell further east [5 weeks].

5. East-Central China:

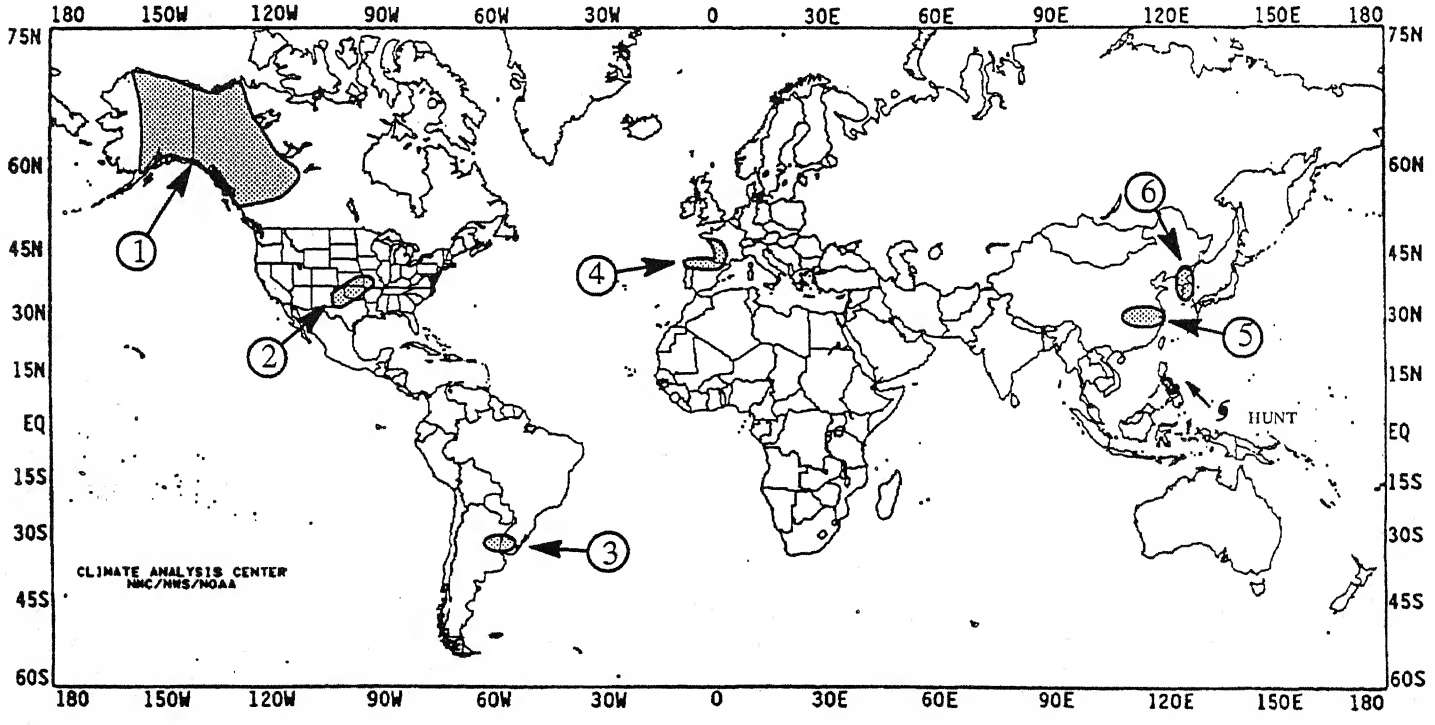
UNUSUALLY WET.

Up to 25 mm of precipitation fell across the area this week in addition to the 100 mm recorded last week as normally drier late autumn weather prevails at this time of the year [4 weeks].

6. North and South Korea:

UNSEASONABLE PRECIPITATION ABATES.

Around 30 mm of late season precipitation was recorded at a few stations on the Korean Peninsula; however, most stations had little or no precipitation [6 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.
MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF NOVEMBER 12 THROUGH NOVEMBER 18, 1989

The clash of bitterly cold Arctic air moving southeastward out of Canada with unseasonably mild southwesterly flow from the Gulf of Mexico was demarcated by a strong cold front that triggered severe weather throughout much of the eastern third of the nation. Large hail, damaging winds, frequent lightning, torrential downpours, and several tornadoes accompanied many of the thunderstorms as the front marched across the Midwest, South, and East during the middle of the week. The hardest hit locations included Huntsville, AL on Wednesday as twisters took the lives of several people and caused extensive property damage, and Newburgh, NY the following day when a tornado collapsed a school cafeteria wall, resulting in 8 deaths and 24 injuries. In contrast, nearly a foot of snow blanketed portions of the northern Rockies on Sunday (11 inches at Browning, MT) while frigid air blowing across the open waters of the Great Lakes generated heavy snow squalls (up to 20 inches in Geauga County, northeastern Ohio) in the snowbelt regions. Early in the week, a storm system brought rain to the Pacific Northwest and snow to the northern Cascades and Rockies. Farther east, a slow-moving cold front reached from the central Great Plains northeastward to the upper Great Lakes. Ahead of the front, southwesterly flow sent record and near-record warmth into the south-central and southeastern U.S. as readings soared into the seventies and eighties (see Figure 1). By mid-week, a large cold air mass in southern Canada spilled southeastward into the north-central U.S. and propelled the cold front eastward. Intense thunderstorms developed ahead of the front from the Ohio Valley southward to the central Gulf Coast on Wednesday, making this the third consecutive year with severe weather in that area on November 15. On Thursday, strong thunderstorms hit the East Coast while frigid air plunged into the Southeast. Towards the end of the week, the cold front had pushed off the Atlantic Coast and extremely cold air covered the eastern third of the country. Another shot of cold air moved into the northern Great Plains behind a weak storm system that produced light snow in parts of the Midwest and New England. In the West, a ridge of high pressure kept most of the region dry and mild. Frigid conditions continued in Alaska as readings dropped to -55°F at Northway Sunday morning; however, temperatures moderated across most of the state during the latter half of the week. Near normal temperatures and generally dry conditions were observed in Hawaii with the exception of unexpected heavy showers at Kahului, Maui.

Even with the abundance of strong thunderstorms and torrential downpours throughout the country east of the Mississippi, there were relatively few stations with excessive weekly precipitation amounts due to the rapid movement of the cold front. According to the River Forecast Centers, the greatest weekly totals (more than 3 inches) were reported in southern Louisiana and Mississippi, in the southern Appalachians, and at a few isolated locations in the mid-Atlantic and New England (see Table 1). Light to moderate amounts fell on the northern thirds of the Pacific Northwest and the Rockies, in sections of the northern Plains and upper Midwest, along the southeastern Alaskan and western Gulf Coasts, and throughout much of the eastern third of the nation. Little or no precipitation was observed across the southern two-thirds of the Pacific Coast, Intermountain West, Rockies, and Plains, and in sections of Florida and the middle Mississippi Valley. After another week of little or no precipitation in the Plains, deficits accumulated since mid-September have risen to nearly 175 mm (7 inches) in the southeastern Great Plains and between 50 and 100 mm (2 and 4 inches) in the central Great Plains and western Corn Belt (see front cover).

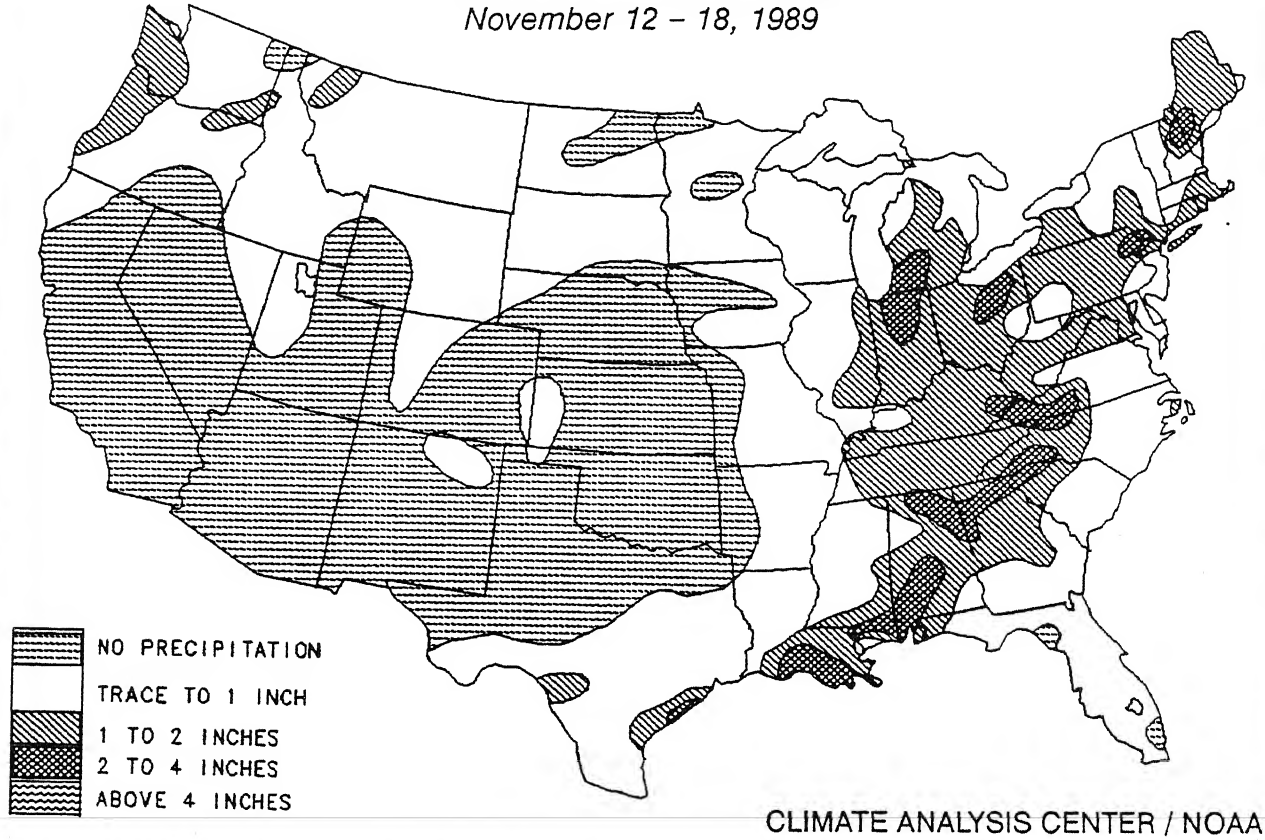
Last week's unseasonably mild weather continued across much of the lower 48 states before cold air invaded the eastern half of the country late in the week and reduced the magnitude of the positive temperature departures. Even so, temperatures still averaged between 5°F and 7°F above normal from New England southward to the mid-Atlantic, in the desert Southwest, and at many stations in the Rockies and southern Plains (see Table 2). On Sunday and Monday, over sixty daily maximum temperature records were tied or broken throughout the contiguous U.S., and a few locations also set all-time November highs. In sharp contrast, negative departures of -8°F to -12°F were recorded in the northern Great Plains and upper Midwest while eastern Alaska remained brutally cold as weekly temperatures averaged up to 19°F below normal and readings plunged under -50°F (see Table 3). In the lower 48 states, several locations equaled or surpassed their daily minimum temperature record on Friday and Saturday as subzero readings reached as far south as Nebraska and Iowa while freezing temperatures extended to the central Gulf Coast. In addition, strong winds combined with low temperatures to produce extremely dangerous wind chills exceeding -30°F in the northern Great Plains and upper Midwest.

TABLE 1. Selected stations with 2.00 or more inches of precipitation for the week.

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
ÆE, KAUAI, HI	5.66	ASHEVILLE, NC	2.30
ETTE ISLAND, AK	4.58	MOBILE, AL	2.24
YETTE, LA	4.28	WILKES-BARRE, PA	2.22
VASHINGTON, NH	4.21	OLYMPIA, WA	2.22
NOKE, VA	3.19	JACKSON, KY	2.21
EZ, AK	2.98	CLEVELAND, OH	2.18
CIOS, TX	2.89	YAKUTAT, AK	2.16
ORLEANS/MOISANT, LA	2.70	MASSENA, NY	2.14
ND RAPIDS, MI	2.68	HUNTSVILLE, AL	2.13
SFIELD, OH	2.64	TACOMA/FT.LEWIS/GRAY AAF, WA	2.07
ERVILLE, GA	2.37	SOUTH BEND, IN	2.01
RIA, OR	2.31	PERU/GRISSOM AFB, IN	2.00

OBSERVED PRECIPITATION

November 12 – 18, 1989



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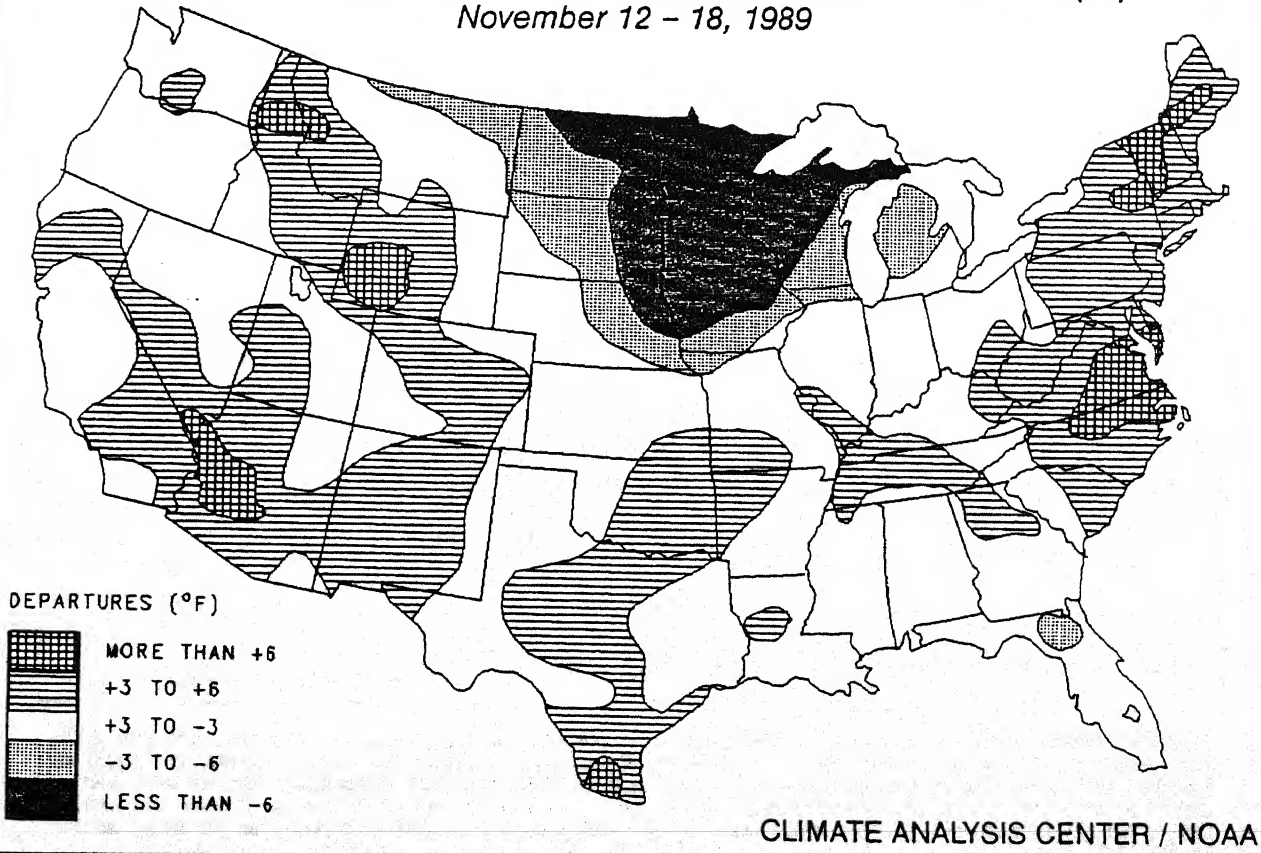
DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

November 12 – 18, 1989



CLIMATE ANALYSIS CENTER / NOAA

TABLE 2. Selected stations with temperatures averaging 5.5°F or more ABOVE normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
VICTORVILLE/GEORGE AFB, CA	+11.4	60.5	BANGOR, ME	+6.2	43.5
BLUE CANYON, CA	+9.5	53.6	DANVILLE, VA	+6.1	55.6
BOZEMAN, MT	+7.7	37.8	PATUXENT RIVER NAS, MD	+6.0	55.6
BURLINGTON, VT	+7.4	44.4	CHARLESTON, WV	+6.0	51.6
PHOENIX, AZ	+7.2	67.8	LAS VEGAS, NV	+5.9	59.4
RICHMOND, VA	+7.1	56.2	ROME/GRIFFISS AFB, NY	+5.9	44.7
ALBANY, NY	+7.1	46.9	MCALLEN, TX	+5.8	72.3
LANDER, WY	+7.0	37.8	PRESCOTT, AZ	+5.8	49.9
ROCK SPRINGS/SWEETWATER, WY	+7.0	36.9	MISSOULA, MT	+5.8	37.7
NORFOLK, VA	+6.9	59.0	JUNCTION, TX	+5.7	59.2
RALEIGH-DURHAM, NC	+6.8	56.9	GREENSBORO, NC	+5.7	54.4
CAPE HATTERAS, NC	+6.7	63.1	RUMFORD, ME	+5.7	41.2
MONTPELIER, VT	+6.7	41.6	BEEVILLE NAS, TX	+5.6	68.6
SANTA MARIA, CA	+6.2	61.6	LEWISTON, ID	+5.6	45.6
RED BLUFF, CA	+6.2	59.6	LEBANON, NH	+5.6	42.1
TRUTH OR CONSEQUENCES, NM	+6.2	54.8	GLENDALE/LUKE AFB, AZ	+5.5	64.0
SALISBURY, MD	+6.2	54.0	BECKLEY, WV	+5.5	47.5

TABLE 3. Selected stations with temperatures averaging 8.0°F or more BELOW normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
NORTHWAY, AK	-18.7	-20.7	PARK FALLS, WI	-9.3	20.9
GULKANA, AK	-17.7	-9.9	ST. CLOUD, MN	-9.2	21.4
BIG DELTA, AK	-14.6	-6.5	SIOUX FALLS, SD	-9.2	23.7
BARROW, AK	-14.1	-14.7	DULUTH, MN	-9.1	19.6
FAIRBANKS, AK	-13.6	-9.4	MASON CITY, IA	-8.9	25.2
WARROAD, MN	-12.5	13.2	ANCHORAGE, AK	-8.8	13.4
BETTLES, AK	-10.8	-10.0	WATERTOWN, SD	-8.7	21.3
BARTER ISLAND, AK	-10.6	-9.9	YAKUTAT, AK	-8.6	23.9
GRAND FORKS, ND	-9.9	16.7	MINNEAPOLIS, MN	-8.5	24.8
TALKEETNA, AK	-9.7	8.2	DEVIL'S LAKE, ND	-8.2	18.4
ROCHESTER, MN	-9.7	23.7	INTERNATIONAL FALLS, MN	-8.1	17.4
FARGO, ND	-9.6	19.0	CORDOVA/MILE 13, AK	-8.1	22.5
SPENCER, IA	-9.5	24.2	SIOUX CITY, IA	-8.1	28.3
ALEXANDRIA, MN	-9.3	20.0			

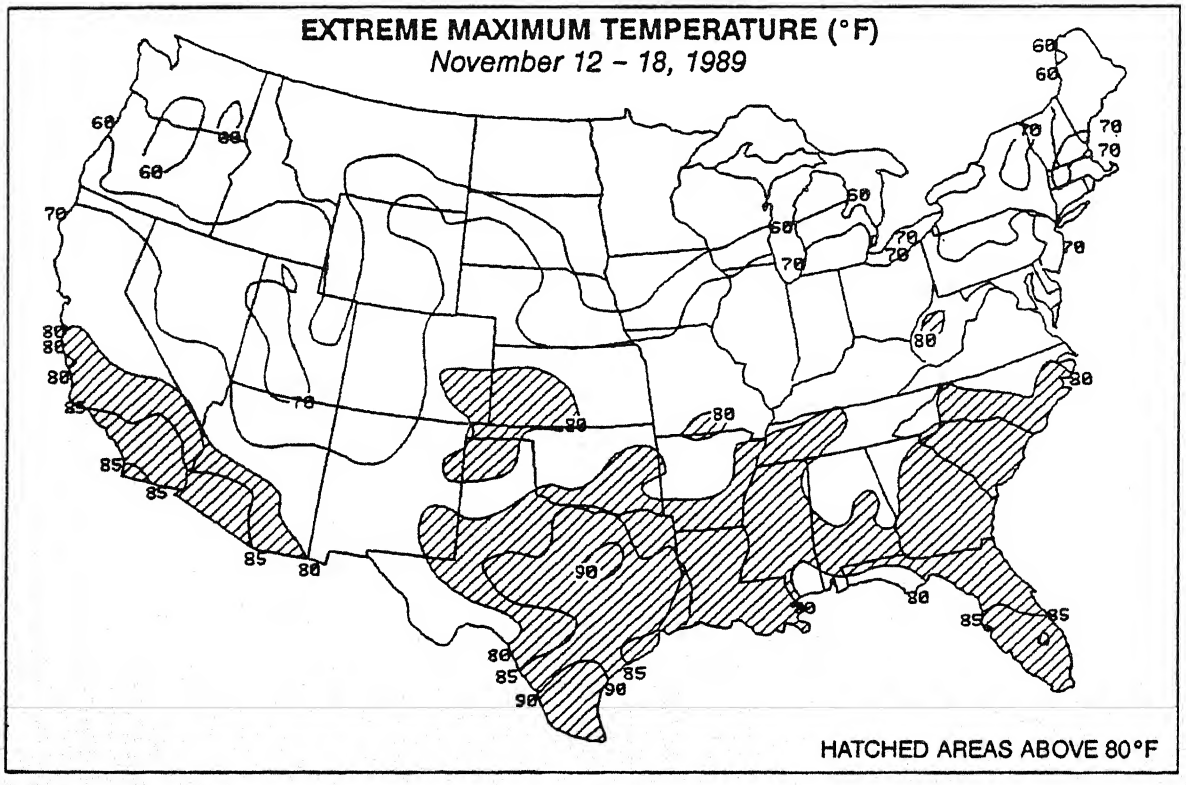
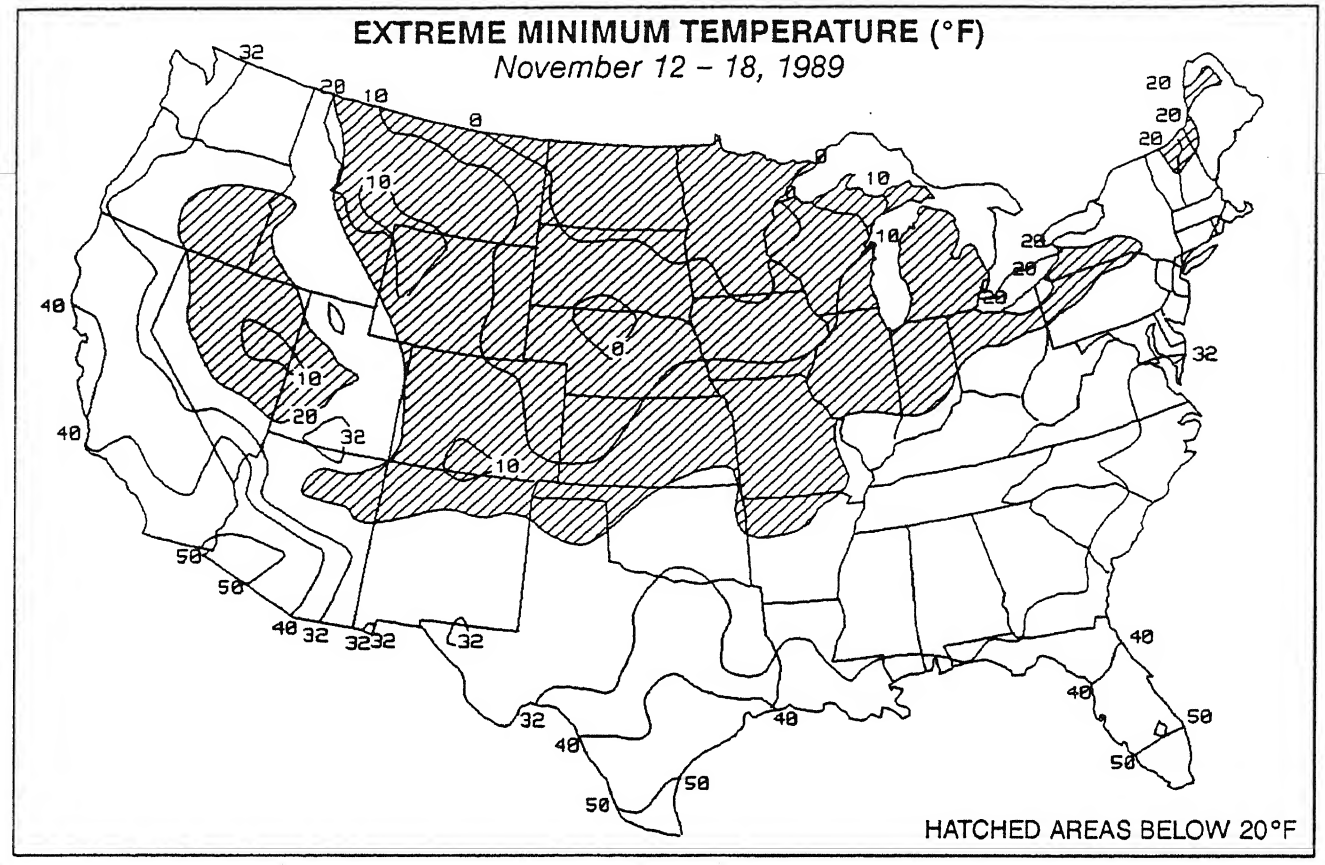
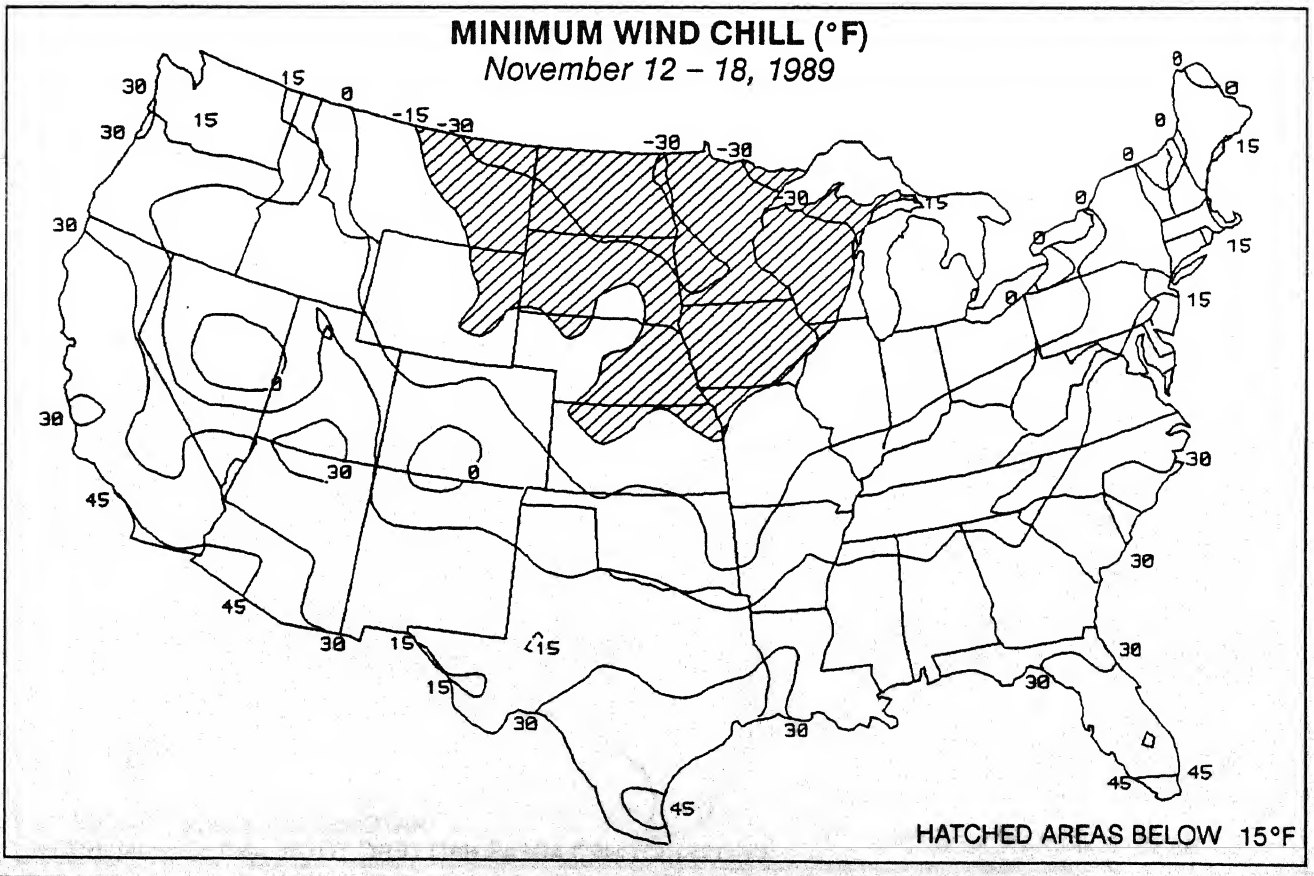
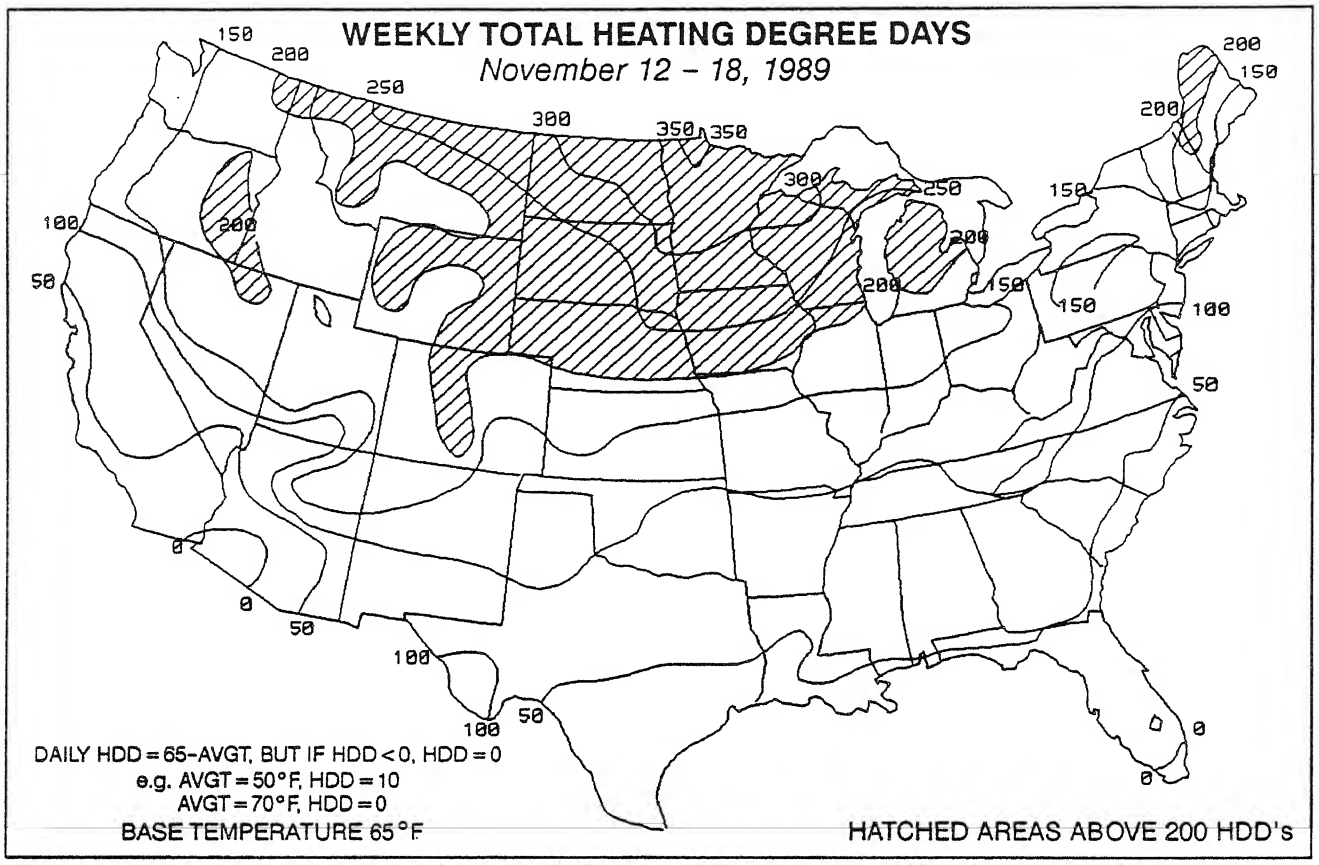


Figure 1. Extreme maximum temperatures (°F) during November 12-18, 1989. Shaded areas are more than 80°F, and isotherms are only drawn for 60°F, 70°F, 80°F, 85°F, and 90°F. Early in the week, unseasonably warm air covered the south-central and southeastern U.S. More than 60 daily maximum temperature records were tied or broken as highs soared into the seventies and eighties. Later in the week, extremely cold air invaded the eastern half of the nation and lows plunged below zero in the north-central U.S. and to freezing as far south as the central Gulf Coast.

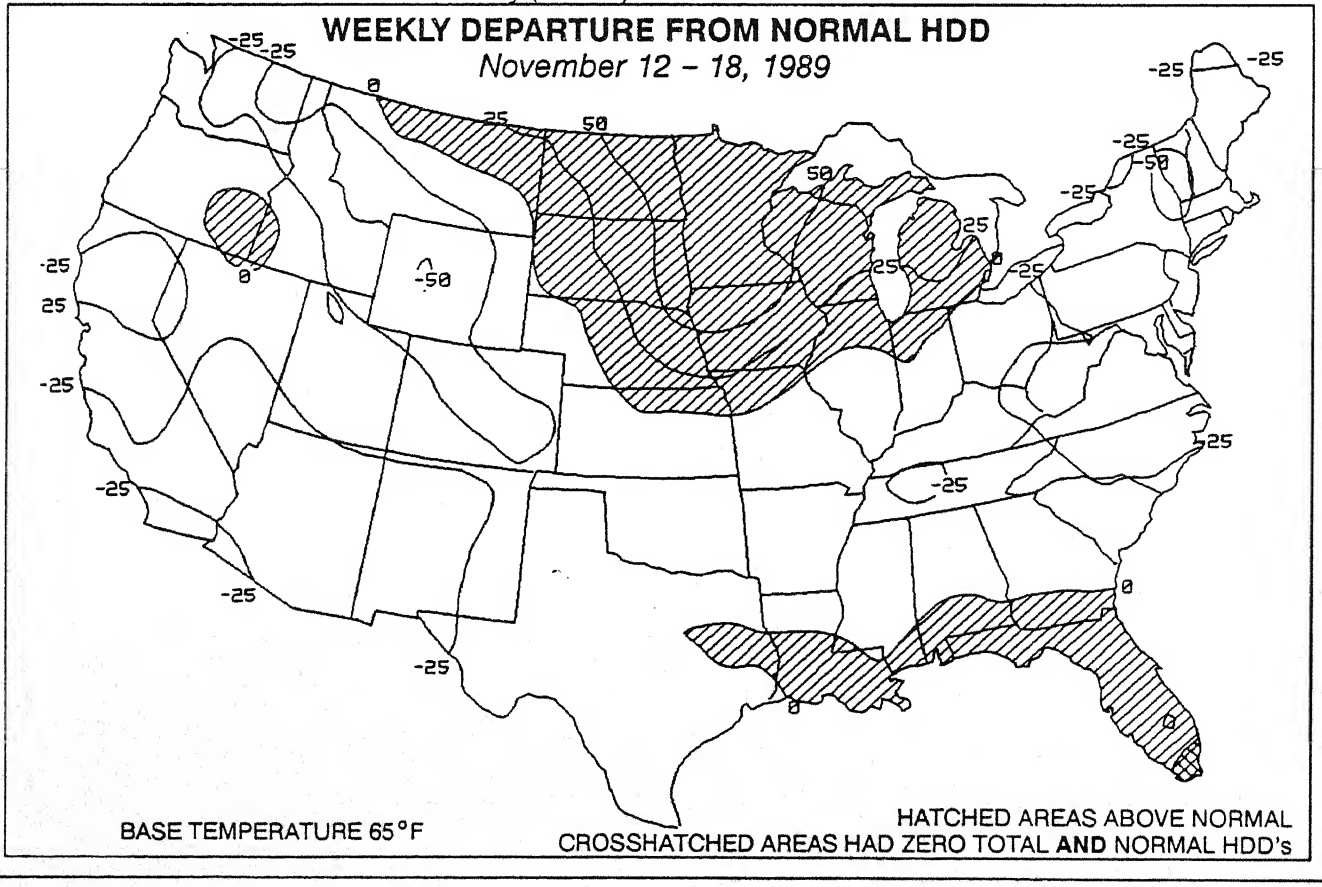


Subzero readings invaded much of North Dakota and Minnesota, and freezing temperatures occurred as far south as the Gulf Coast in response to a blast of frigid Arctic air (top). The combination of very low temperatures and gusty winds produced extremely dangerous wind chills surpassing -30°F in portions of the north-central U. S. (bottom).



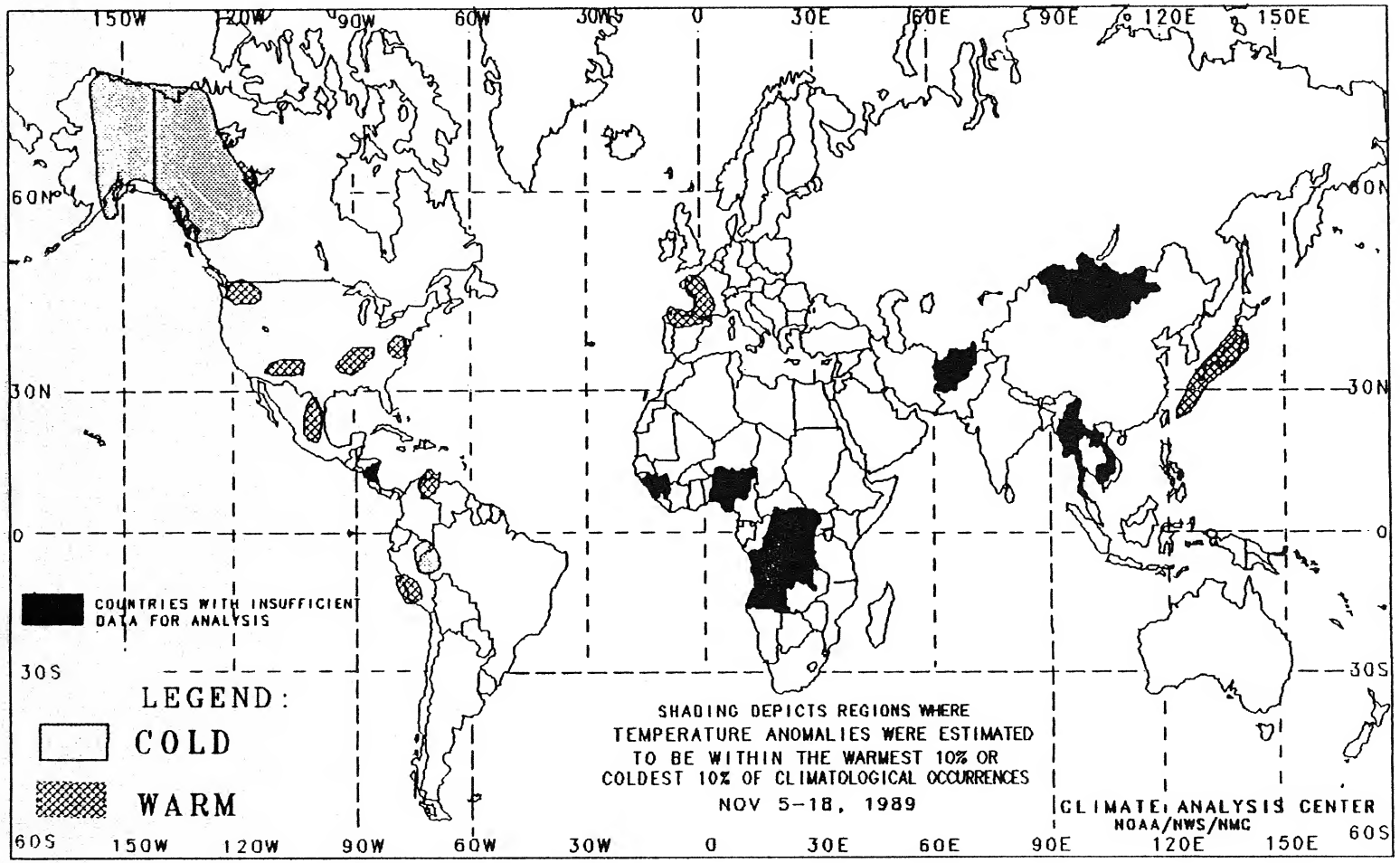


Bitterly cold Arctic air chilled the north-central U. S. as total HDD's exceeded 250 in the upper Midwest and northern Plains (top). Much above normal weekly heating demand was limited to the western Great Lakes and the northern Great Plains and Mississippi Valley while Indian Summer weather greatly reduced the usual heating demand across most of the remainder of the country (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

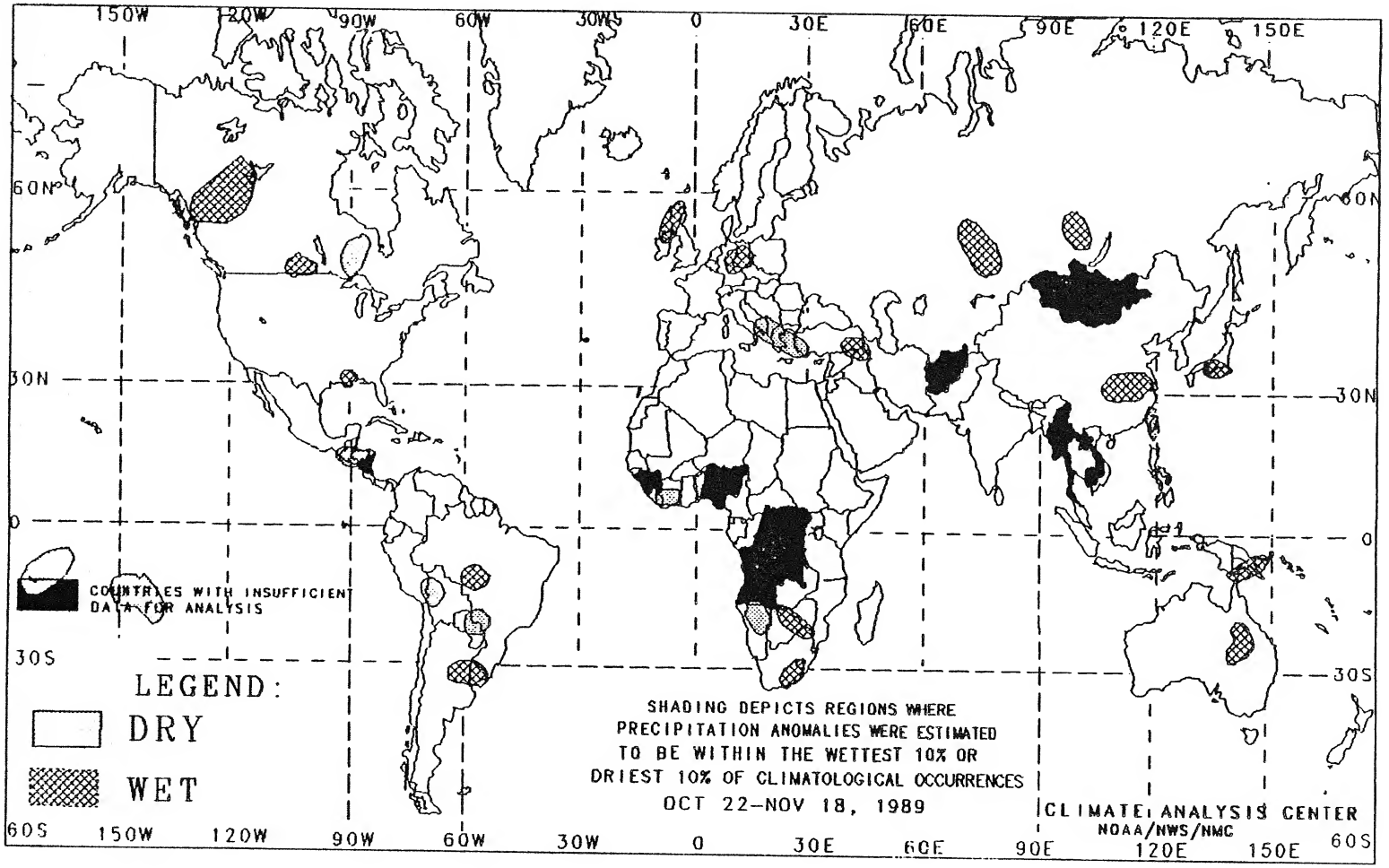
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

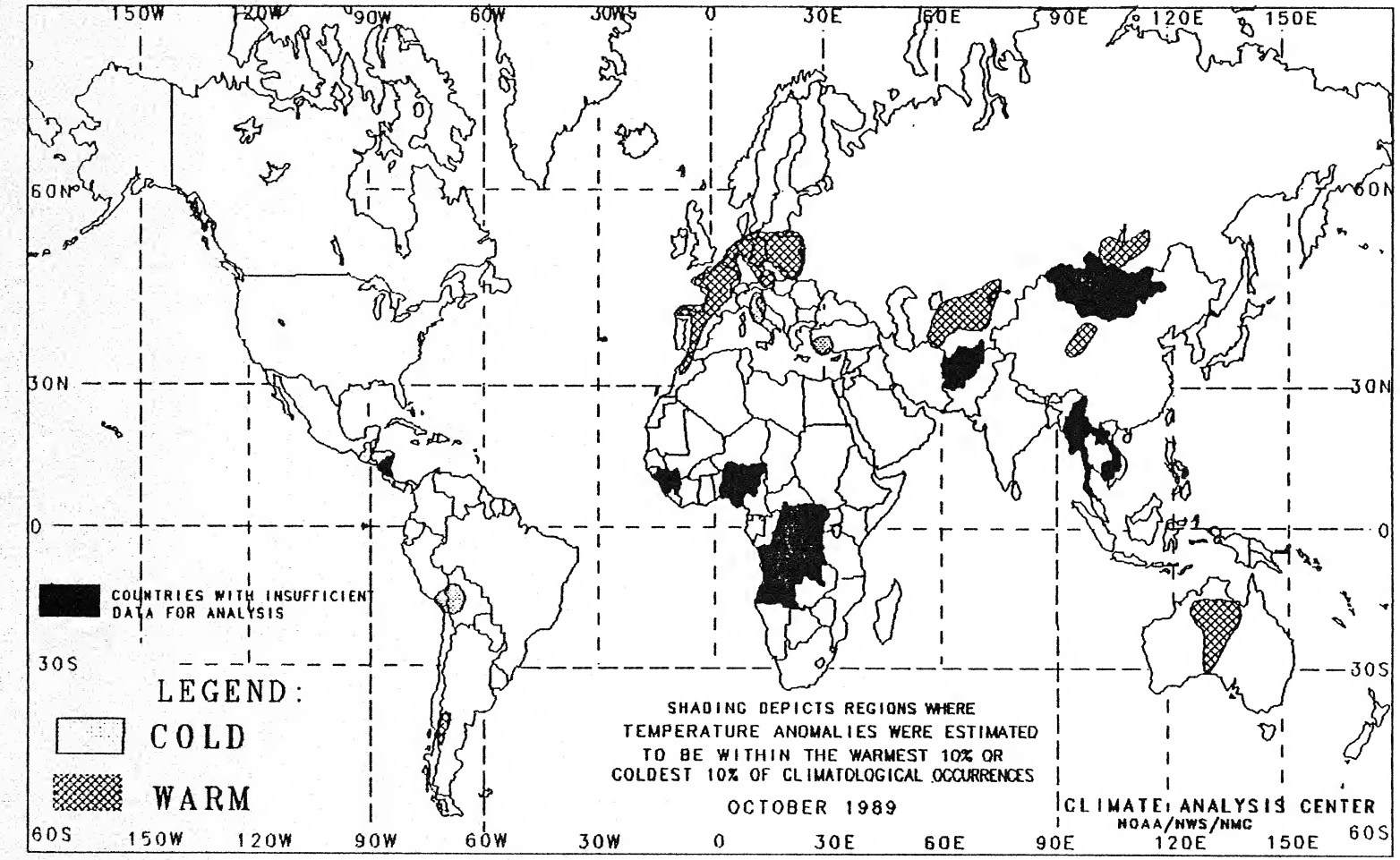
In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL TEMPERATURE ANOMALIES

1 MONTH



The anomalies on this chart are based on approximately 2500 observing stations for which at least 26 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of one month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

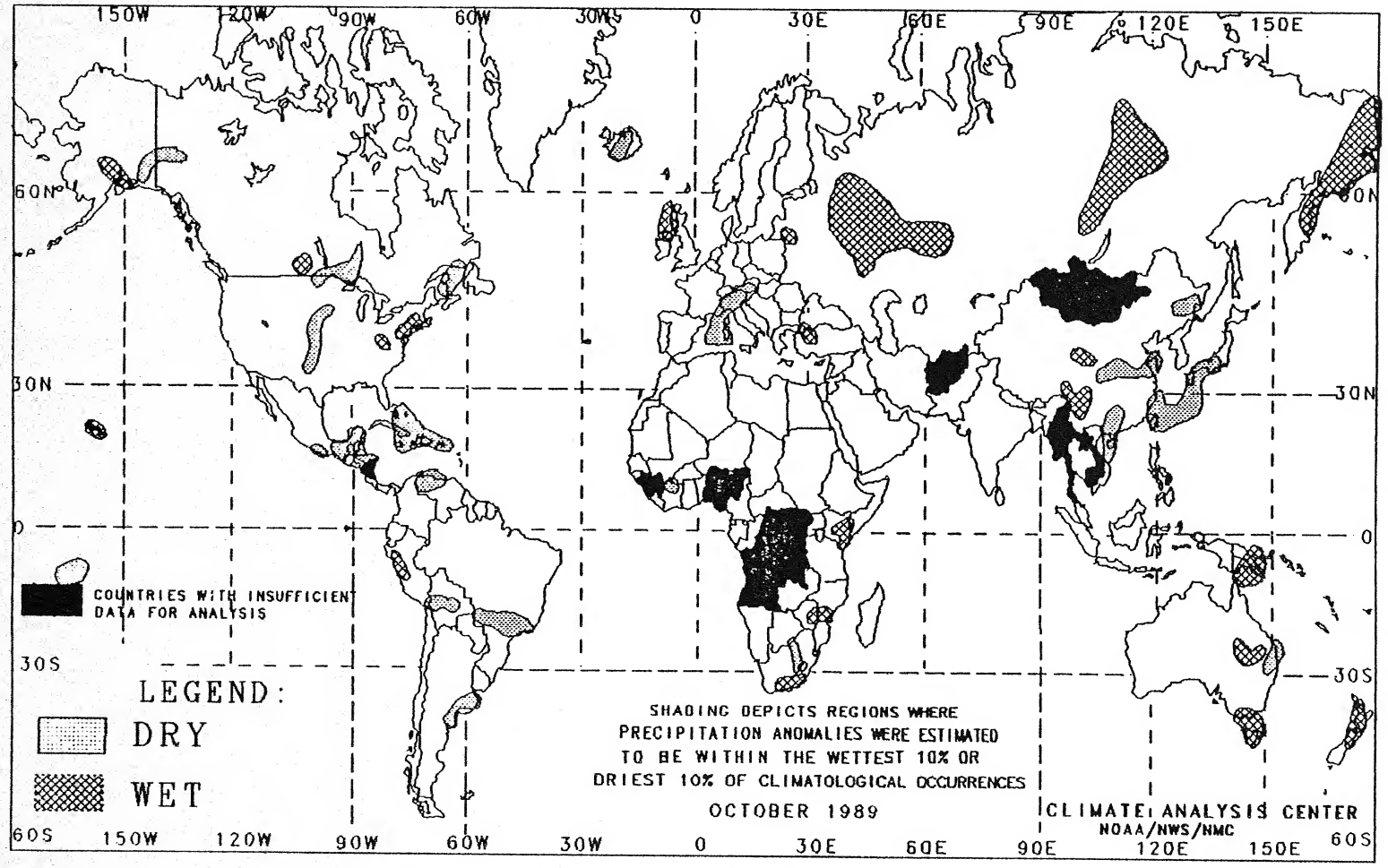
PRINCIPAL TEMPERATURE ANOMALIES

OCTOBER 1989

REGIONS AFFECTED	TEMPERATURE AVERAGE (°C)	DEPARTURE FROM NORMAL (°C)	COMMENTS
NORTH AMERICA			
No Significant Temperature Anomalies			
SOUTH AMERICA AND EASTERN PACIFIC			
Peru and Bolivia	+9 to +26	-2 to -3	COLD – 4 weeks
West Central Argentina	+9 to +10	Around +2	Very mild first half of October
EUROPE AND THE MIDDLE EAST			
Europe	+9 to +21	+2 to +3	Very warm second half of October
Italy	+12 to +14	Around -2	Very cool first half of October
Northwestern Turkey	+11 to +18	-2 to -3	Very cool middle of October
AFRICA			
Morocco	+21 to +23	+2 to +10	WARM – 8 weeks
ASIA			
South Central Soviet Union	-2 to +3	+2 to +4	MILD – 2 to 10 weeks
South Central Siberia	+8 to +18	+2 to +3	WARM – 2 to 10 weeks
North Central China	+7 to +9	+2 to +4	MILD – 5 weeks
AUSTRALIA AND WESTERN PACIFIC			
Central Australia	+20 to +32	+2 to +3	Very warm first half of October

GLOBAL PRECIPITATION ANOMALIES

1 MONTH



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies

In climatologically arid regions where normal precipitation for the one month period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total one month precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of one month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

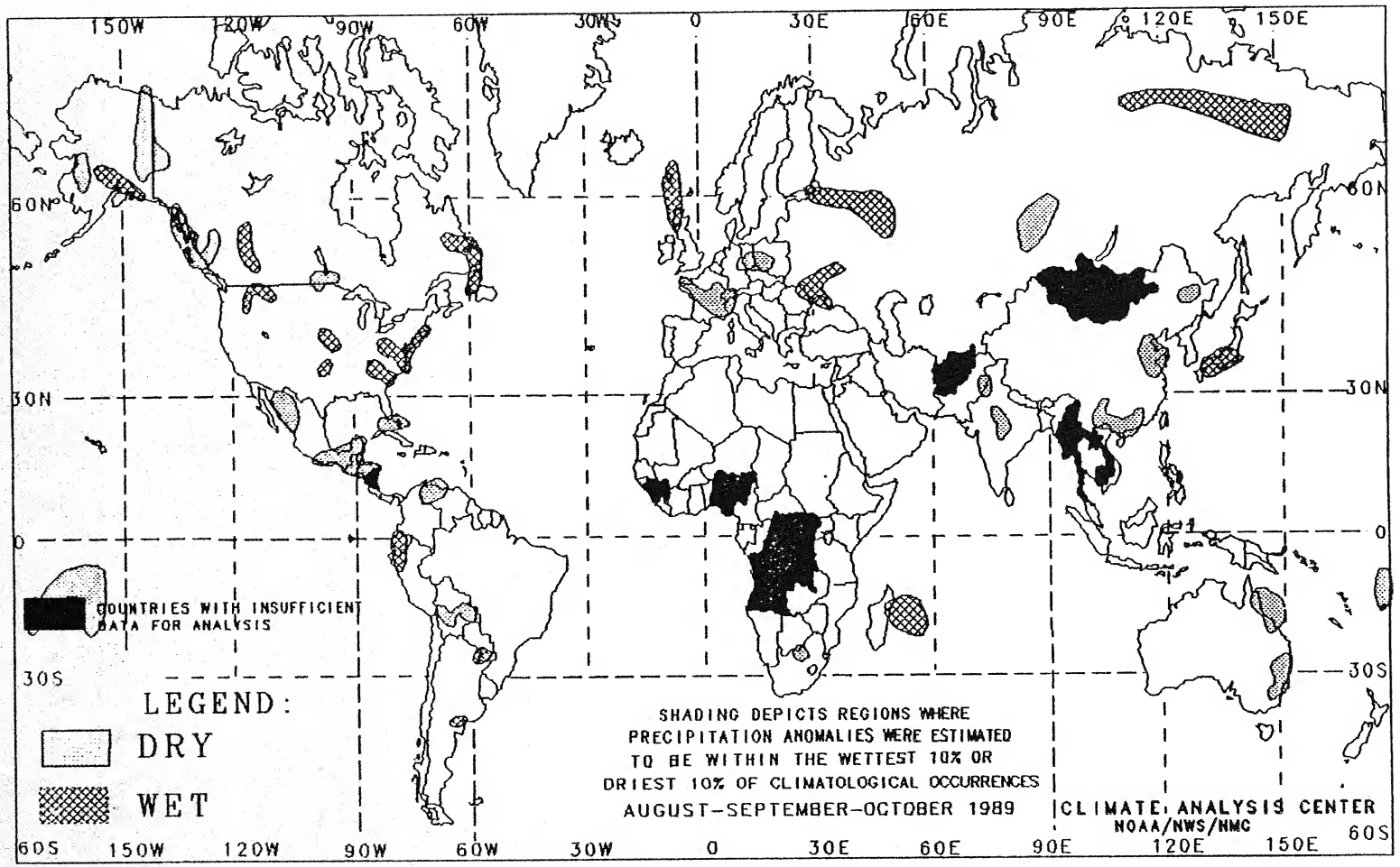
PRINCIPAL PRECIPITATION ANOMALIES

OCTOBER 1989

REGIONS AFFECTED	PRECIPITATION TOTAL (MM)	PERCENT OF NORMAL	COMMENTS
NORTH AMERICA			
South Central Alaska	59 to 92	204 to 216	WET – 5 to 10 weeks
Southeastern Alaska and Adjacent Canada	0 to 5	0 to 18	DRY – 5 to 9 weeks
Southern Saskatchewan	46 to 51	210 to 276	Heavy precipitation second half October
South Central Canada and Adjacent North Dakota	0 to 24	0 to 38	DRY – 4 weeks
Southeastern Canada	31 to 56	32 to 52	DRY – 4 to 9 weeks
West Virginia	109 to 133	185 to 195	WET – 2 to 4 weeks
Eastern United States	136 to 213	169 to 225	Heavy precipitation second half of October
Central United States	0 to 3	0 to 9	DRY – 7 to 9 weeks
Hawaiian Islands	120 to 144	304 to 540	Heavy precipitation first half of October
Southwestern Mexico	9 to 33	6 to 41	DRY – 6 weeks
Honduras and Southern Mexico	19 to 142	16 to 31	DRY – 4 weeks
Caribbean Islands	10 to 34	6 to 20	DRY – 6 to 10 weeks
SOUTH AMERICA AND EASTERN PACIFIC			
Western Venezuela	3 to 16	5 to 28	DRY – 5 to 6 weeks
Western Peru	67 to 243	205 to 330	WET – 4 weeks
West Central Bolivia	5 to 46	11 to 27	DRY – 4 to 8 weeks
Brazil and Eastern Bolivia	16 to 136	17 to 51	DRY – 4 weeks
East Central Argentina	0 to 25	0 to 32	DRY – 10 weeks
Cook Islands	66 to 73	32 to 41	DRY – 6 to 14 weeks
EUROPE AND THE MIDDLE EAST			
Western Iceland	13 to 69	29 to 41	DRY – 5 weeks
Ireland and Scotland	189 to 231	173 to 186	Heavy precipitation second half of October
South Central Europe	4 to 15	3 to 13	DRY – 5 to 10 weeks
Western Turkey	78 to 164	221 to 312	WET – 4 to 9 weeks
West Central European Soviet Union	90 to 107	197 to 222	WET – 2 to 4 weeks
East Central European Soviet Union	52 to 141	194 to 326	WET – 4 to 8 weeks
AFRICA			
Northwestern Ivory Coast	6 to 51	5 to 30	DRY – 7 weeks
Kenya	60 to 230	213 to 318	WET – 10 weeks
Central Mozambique and Adjacent Zimbabwe	70 to 154	203 to 589	WET – 2 to 10 weeks
Central South Africa	2 to 5	4 to 12	DRY – 8 to 14 weeks
Coast of South Africa	147 to 314	223 to 326	WET – 4 to 7 weeks
ASIA			
Central Siberia	35 to 71	149 to 381	WET – 4 to 9 weeks
Eastern Siberia	56 to 91	173 to 439	WET – 4 to 10 weeks
Northeastern China	5 to 19	19 to 44	DRY – 7 weeks
Central China	49 to 66	198 to 258	Heavy precipitation first half of October
East Central China	1 to 15	3 to 24	DRY – 5 to 10 weeks
Taiwan and Japan	0 to 56	0 to 46	DRY – 5 to 10 weeks
Southwestern China	65 to 439	166 to 293	WET – 4 weeks
Vietnam and South Central China	3 to 273	6 to 45	DRY – 6 to 10 weeks
AUSTRALIA AND WESTERN PACIFIC			
Papua New Guinea	99 to 539	191 to 750	Heavy precipitation second half of October
Southern Queensland	89 to 210	335 to 569	Heavy precipitation second half of October
Coast of Queensland	19 to 29	19 to 44	DRY – 10 to 14 weeks
Victoria and Tasmania	106 to 174	183 to 199	WET – 4 weeks
New Zealand	138 to 224	190 to 317	WET – 4 to 14 weeks

GLOBAL PRECIPITATION ANOMALIES

3 MONTH

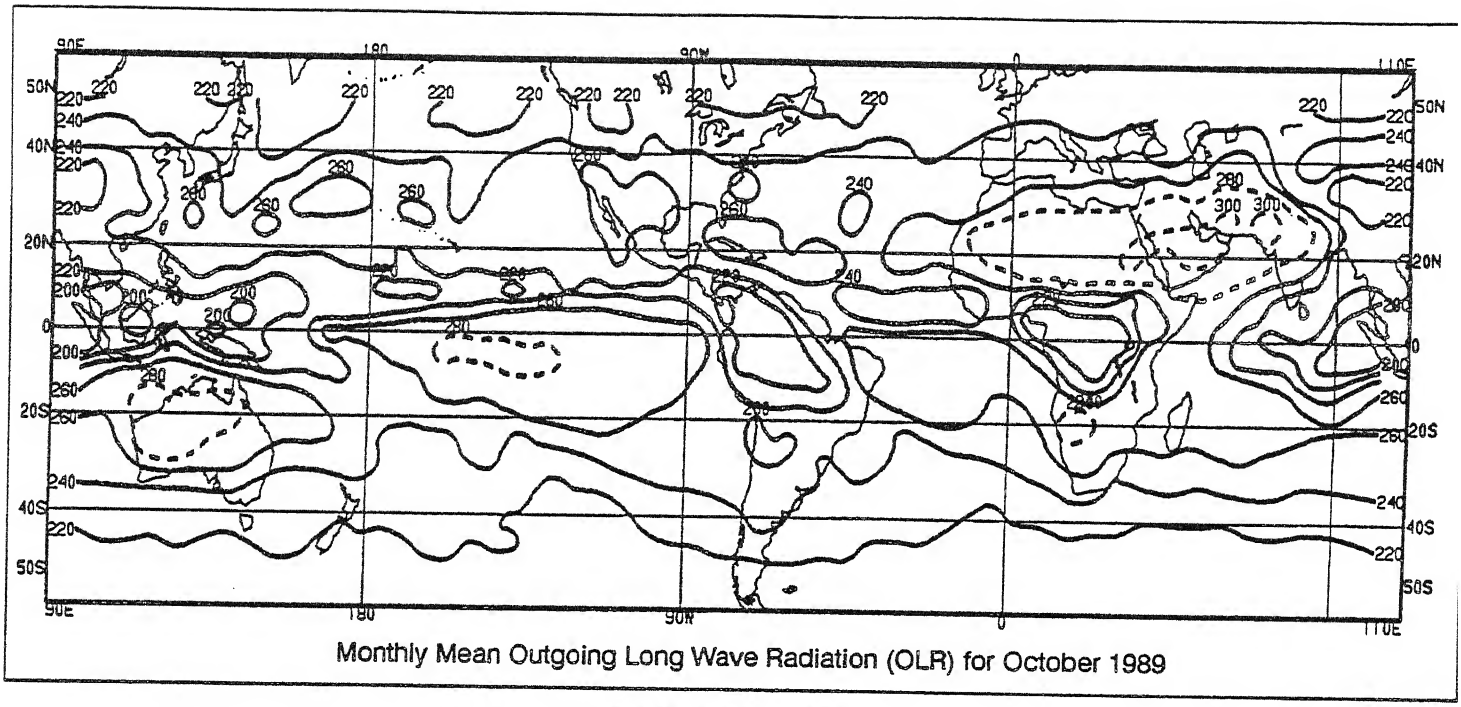


The anomalies on this chart are based on approximately 2500 observing stations for which at least 81 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies

In climatologically arid regions where normal precipitation for the three month period is less than 50 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total three month precipitation exceeds 125 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of three month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

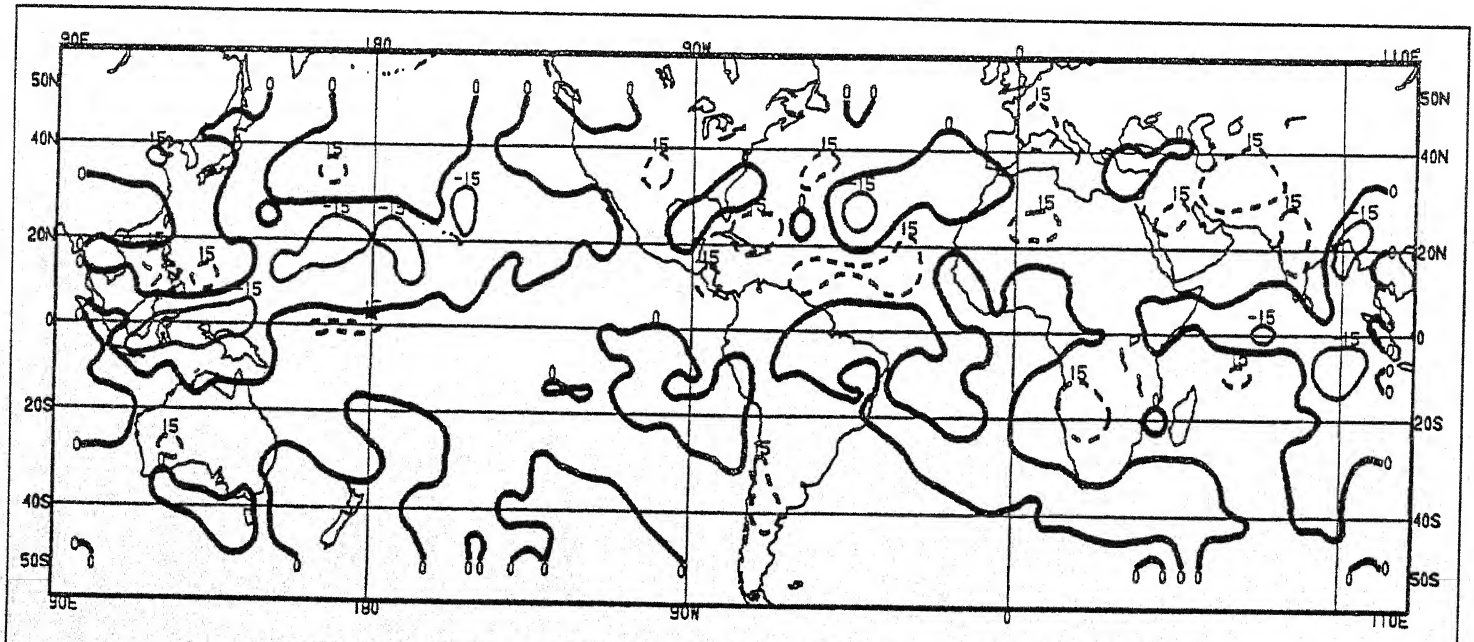


Monthly Mean Outgoing Long Wave Radiation (OLR) for October 1989

EXPLANATION

The mean monthly outgoing long wave radiation (OLR) as measured by the NOAA-9 AVHRR IR window channel by NESDIS/SRL (top). Data are accumulated and averaged over 2.5° areas to a 5° Mercator grid for display. Contour intervals are 20 Wm^{-2}, and contours of 280 Wm^{-2} and above are dashed. In tropical areas (for our purposes 20°N - 20°S) that receive primarily convective rainfall, a mean OLR value of less than 200 Wm^{-2} is associated with significant monthly precipitation, whereas a value greater than 260 Wm^{-2} normally indicates little or no precipitation. Care must be used in interpreting this chart at higher latitudes, where much of the precipitation is non-convective, or in some tropical coastal or island locations, where precipitation is primarily orographically induced. The approximate relationship between mean OLR and precipitation amount does not necessarily hold in such locations.

The mean monthly outgoing long wave radiation anomalies (bottom) are computed as departures from the 1979 - 1988 base period mean. Contour intervals are 15 Wm^{-2}, while positive anomalies (greater than normal OLR, suggesting less than normal cloud cover and/or precipitation) are dashed and negative anomalies (less than normal OLR, suggesting greater than normal cloud cover and/or precipitation) are solid.



Monthly Mean Outgoing Long Wave Radiation (OLR) Anomaly for October 1989